CLAIM AMENDMENTS:

Claim 1 (original): A pinion shaft formed using a non-refined steel as a material, comprising:

a shaft section; and a pinion teeth forming section connecting with the shaft section,

the pinion teeth forming section comprising pinion teeth and a tooth bottom,

the pinion teeth forming section and the shaft section being provided with a hardened layer that has been subjected to high frequency quenching and tempering,

the steel containing 0.45 to 0.55 % by mass of C, 0.10 to 0.50 % by mass of Si, 0.15 to 0.25 % by mass of Mo, and 0.0005 to 0.005 % by mass of B, and

surface hardnesses of the pinion teeth forming section and the shaft section being 650 to 760 HV in terms of Vickers hardness.

Claim 2 (original): The pinion shaft according to claim 1, wherein the steel further contains 0.5 to 1.2 % by mass of Mn.

Claim 3 (original): The pinion shaft according to claim 2, wherein the steel further contains at least one type selected from not more than 0.5 % by mass of Cr, not more than 0.5 % by mass of Cu, and not more than 0.5 % by mass of Ni.

Claim 4 (original): The pinion shaft according to claim 3, wherein the steel further contains not more than 0.025 % by mass of P, not more than 0.025 % by mass of S, 0.005 to 0.10 % by mass of Ti, and not more than 0.015 % by mass of N, and satisfies following equations 1 and 2, respectively representing the contents (% by

mass) of C, Si, Mn, Cr, Mo, Cu, Ni, and Cr by a(C), a(Si), a(Mn), a(Cr), a(Mo), a(Cu), a(Ni), and a(Cr), the residual being composed of Fe and inevitable impurities.

Equation 1 ・・・ $0.80 \leqq Ceq \leqq 0.95$

where $Ceq = a(C) + 0.07 \times a(Si) + 0.16 \times a(Mn) + 0.20 \times a(Cr) + 0.72 \times a(Mo)$

Equation 2 ・・・ f value $\leqq 1.0$

where f value $= 2.78 - 3.2 \times a(C) + 0.05 \times a(Si) - 0.60 \times a(Mn) - 0.55 \times a(Cu) - 0.80 \times a(Ni) - 0.75 \times a(Cr)$

Claim 5 (original): The pinion shaft according to claim 1, wherein Vickers hardnesses of the pinion teeth forming section and the shaft section in a portion deeper than the hardened layer are 260 to 300 HV.

Claim 6 (currently amended): The pinion shaft according to claim 1, wherein a ratio D/R of an effective case depth D at which the hardness in the tooth bottom is not ~~more~~ less than 450 HV in terms of Vickers hardness to a radius R of the tooth bottom is in a range of 0.1 to 0.5.

Claim 7 (original): The pinion shaft according to claim 1, wherein a ratio D/R of an effective case depth D at which the hardness in the tooth bottom is not less than 450 HV in terms of Vickers hardness to a radius R of the tooth bottom is in a range of 0.2 to 0.4.

Claim 8 (original): The pinion shaft according to claim 1, wherein a ratio d/r of an effective case depth d at which the hardness in the shaft section is not less than 450 HV in terms of Vickers hardness to a radius r of the shaft section is in a range of 0.05 to 0.6.

Claim 9 (original): The pinion shaft according to claim 1, wherein a ratio d/r of an effective case depth d at which the hardness in the shaft section is not less than 450 HV in terms of Vickers hardness to a radius r of the shaft section is in a range of 0.35 to 0.5.